

Chemical Reactions

Notes

Learning Objective: In writing, SWBAT relate, and give examples of, chemical formulas and chemical reactions, using academic language.

Chemical formula

a formula that shows the type and number of atoms in a compound

Examples of formulas

- H_2O (water)
- CO_2 (carbon dioxide)
- NaCl (salt)

Chemical reaction

a reaction in which atoms and molecules break up and join together in new ways to form different compounds

Examples of chemical reactions

- rust
- burning

Rust

a brown substance that forms on iron when it comes into contact with oxygen and water



Burn

when a substance combines with oxygen and produces flames or smoke when heated

When a substance is burned, it produces a new compound

Example: wood or paper that is burned turns to ash

Chemical Reactions**Check Your Understanding**

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1. What elements do you see in the pictures? What compound do you see?

The elements in the pictures are _____ and _____. The compound is _____.

2. What forms when two or more different atoms join together?

A _____ forms when two or more different atoms join together.

3. What happens during a chemical reaction?

During a chemical reaction, atoms _____ and _____ to _____.

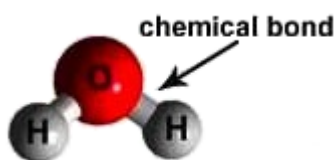
4. What does the arrow in the equation for water show?

The arrow in the equation for water shows that _____ and _____ combine to form _____ .

Learning Objective: In writing, SWBAT explain the role of chemical bonds, and compare and contrast exothermic and endothermic reactions, with examples, using academic language.

Chemical bond

a force of attraction that holds atoms together



Chemical bonds form when atoms join to form molecules

How bonds form

atoms lose, gain or share electrons

<http://www.brainpop.com//science/matterandchemistry/chemicalbonds/>

Chemical reactions break bonds and form new ones

Exothermic reaction

a reaction that releases energy

Exo = outside, outward

Thermic = heat

Exo + thermic means "putting out heat"

Examples of
exothermic reactions

- burning flame
- making ice
- condensation
- turning on a light
- exercising



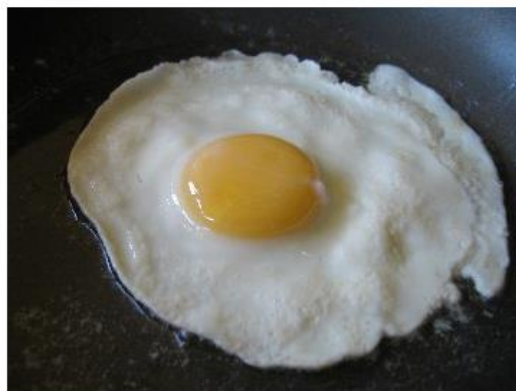
Endothermic reaction

a reaction that takes in energy

Endo + thermic means "taking in heat"

Examples of
endothermic reactions

- melting ice
- cooking an egg
- evaporating water
- boiling water



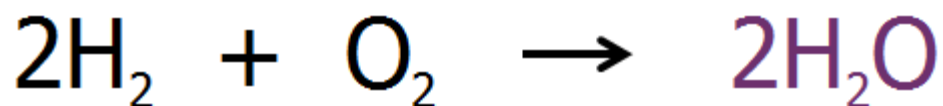
Learning Objective:

In writing, SWBAT define and explain the parts of a chemical reaction using academic language.

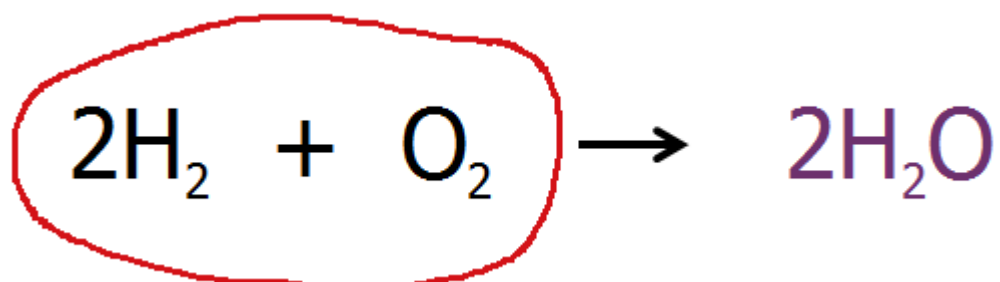
Chemical equation

describes what happens in a chemical reaction

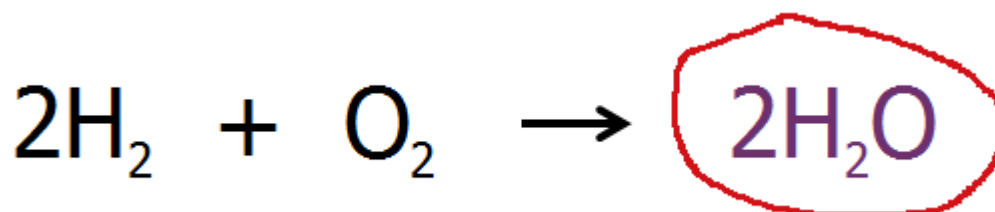
Example: hydrogen and oxygen join to form water



Before the reaction, there are
FOUR atoms of hydrogen and
TWO atoms of oxygen



After the reaction, there are still
FOUR atoms of hydrogen and
TWO atoms of oxygen



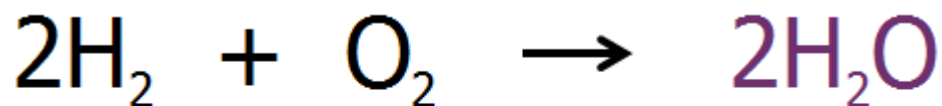
***Atoms are NOT lost or created

 They are just rearranged

Reactants

the substances at the beginning of
a chemical reaction

Reactants are on the left side of
the arrow



Reactants

React

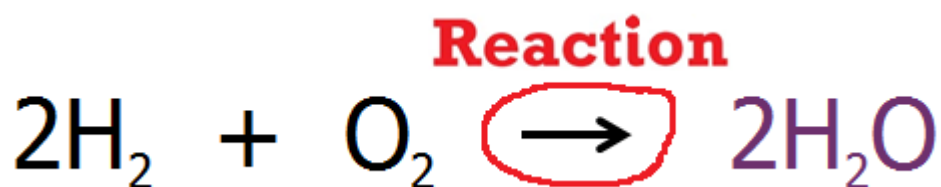
one substance combines with another substance chemically to form a new substance

Arrow in a chemical equation

= “yields” or “produces”

It shows that a chemical reaction has occurred

The arrow also shows the direction of the reaction

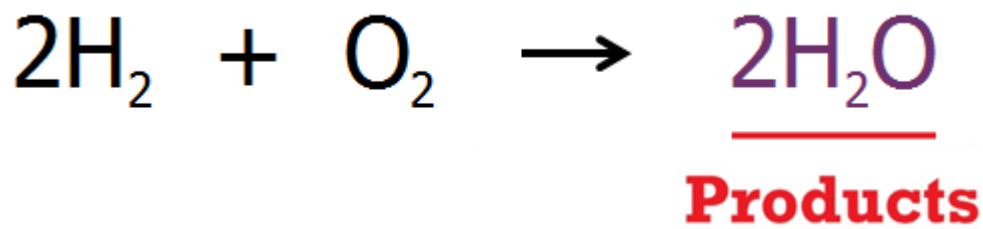


Example: the arrow shows that hydrogen and oxygen combine to form water

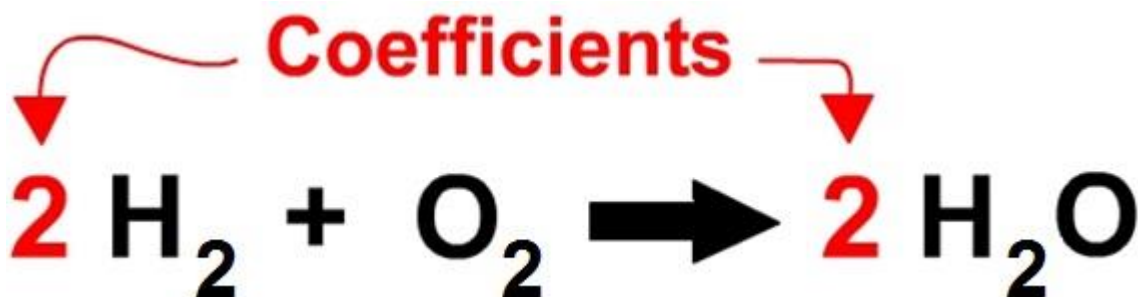
Product

the substance that is formed during a chemical reaction

The product is on the right side of the arrow

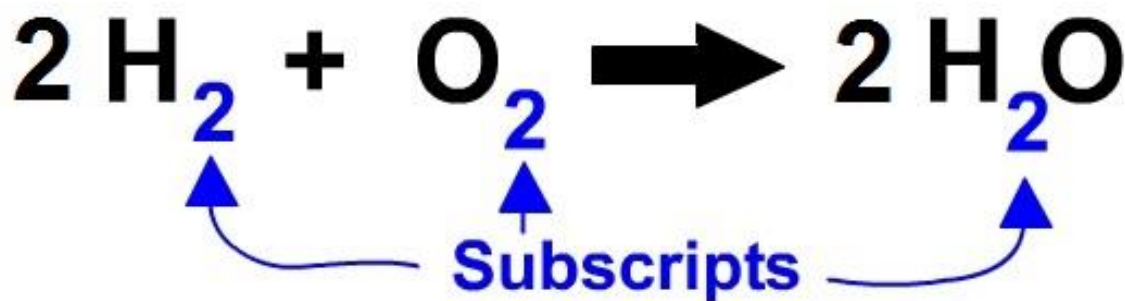
**Coefficient**

number that shows how many molecules are involved in a chemical reaction

**Subscript**

number of atoms in each molecule

It is written to the lower right of a chemical symbol



If there is no coefficient or subscript, there is only one atom or molecule

<http://www.brainpop.com/science/matterandchemistry/chemical-equations/>

Chemical Reactions

Science Skill

Reading an Equation

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1. What are the reactants in the equation?

The reactants in the equation are _____ and _____.

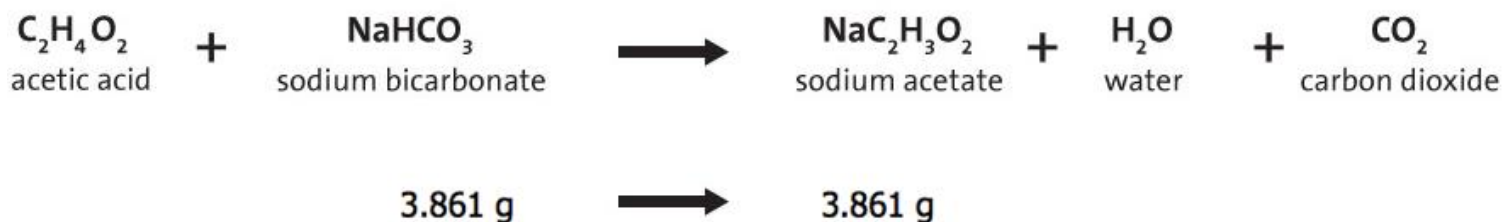
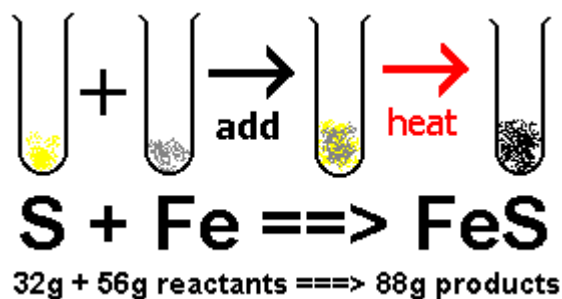
2. What elements are combined in the product?

The elements _____ and _____ are combined in the product.

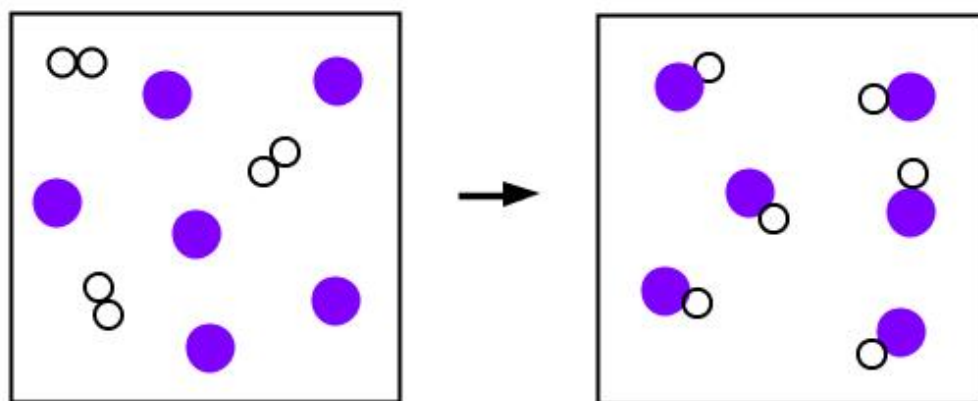
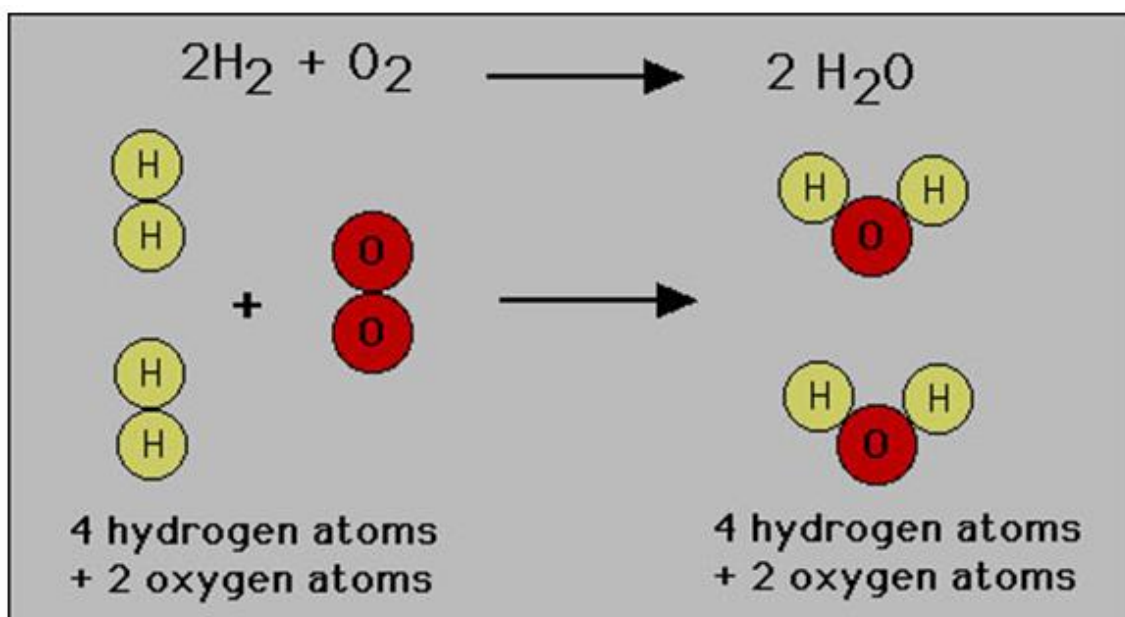
Law of conservation of mass

matter cannot be created or destroyed


The mass of the reactants is the same as the mass of the products



The total number of atoms in the reactants is the same as the number of atoms in the product



In a chemical reaction, the type and mass of the elements do not change

 they are just rearranged

<http://www.brainpop.com/science/matterandchemistry/conservationofmass/>

Chemical Reactions

Check Your Understanding

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1. What type of particle can be shared by atoms in a chemical bond?

The type of particle that can be shared by atoms in a chemical bond is the _____ .

2. What does a chemical equation tell you?

A chemical equation tells you _____ .

3. What is the law of conservation of mass?

The law of conservation of mass states _____ .

4. What is the mass of the salt?

The mass of the salt is _____ .